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## Understanding the Impact of Extrinsic and Intrinsic Motivation on Knowledge Sharing

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## Understanding the Impact of Extrinsic and Intrinsic Motivation on Knowledge Sharing

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### Abstract

*Organisations invest heavily in knowledge management technologies and initiatives which are entirely dependent on the willingness of employees to share their knowledge. Educational and reward programs need to be informed by an understanding of what motivates people to share their knowledge at work. Prior research based on motivational theories suggests the importance of intrinsic and extrinsic motivators to encourage voluntary pro-social behaviours such as knowledge sharing. However, the literature on motivation in the context of knowledge sharing is still emerging and fragmented. This research-in-progress paper therefore proposes an integrated model that brings together theoretical insights from motivational research to explain the influence of key intrinsic and extrinsic motivators on knowledge sharing. The paper reports the results of the assessment of the model based on data collected across 8 organisations in New Zealand. The preliminary discussion of the results contributes to the understanding of motivational factors influencing attitude and intention to share knowledge and their relative importance.*

### Keywords

Intrinsic motivation, extrinsic motivation, knowledge sharing

### INTRODUCTION

The companies that are able to manage their collective expertise and knowledge effectively have a competitive edge by being more innovative, efficient and effective in the marketplace (Alavi and Leidner 2001; Levin and Cross, 2004). To pursue this competitive advantage, companies set up knowledge management systems and practices (Ipe, 2003). People are the source of knowledge. Knowledge resides in people and specifically in the individual members of an organisation (Nonaka, 1994). They bring the experience and expertise that can create value for organisations. Therefore, the creation of organisational knowledge is ultimately dependent on whether the knowledge held by individuals is also shared with others and thus whether the knowledge can move from individual knowledge to the level of groups and the organisational level (Cabrera and Cabrera, 2005; Ipe, 2003). This ultimately depends on peoples' willingness to share their knowledge. However, people do not always want to share their knowledge because of factors such as lack of trust, fear of loss of power and fear of redundancy (Gagné, 2009; Huber, 2001). Managers have identified "a culture of hoarding knowledge" as one of the biggest obstacles to knowledge management (Sveiby and Simons, 2002, p. 421).

Research across different disciplines, such as organizational behaviour, industrial psychology and organizational design, has stressed the importance of motivation to address the problem of knowledge hoarding and to deepen our understanding of employees' knowledge sharing behaviour (Quigley et al. 2007; Bock and Kim, 2001). Research has identified and examined different motivational factors that influence people to share their knowledge more frequently and more effectively (Kankanhalli et al 2005a, Lin 2007). This includes extrinsic motivators such as organisational rewards and intrinsic motivators such as self-efficacy. However, most studies focus only on one type of motivators or individual measures of intrinsic or extrinsic motivation (Bock et al 2002). While these studies have recognised the importance of these motivators for knowledge sharing, the field is quite fragmented. When a study investigates one type of motivation it may not reflect completely what motivates people to share knowledge. For example, if a model only includes extrinsic motivators, they may be considered more important and significant. An integrative model can show the relative importance of motivational factors.

Therefore, the objective of this study is to fill these gaps with the specific aim of identifying the key intrinsic and extrinsic motivators that may influence an individual's knowledge sharing attitude at the workplace, and examining their relative influence on knowledge sharing attitude and intention. The findings of the study are expected to provide a better understanding of how individuals are motivated to share knowledge in their organisations. This understanding can be of benefit to organizations as they can adapt their management strategies to improve employees' motivation.

## LITERATURE REVIEW

Motivation refers to the psychological processes that give people the energy, direction and persistence for action (Ryan and Deci, 2000). Motivation is at the core of activation and intention and has an outcome that produces certain kinds of behaviour, such as knowledge sharing behaviour. Developing an understanding of motivation is essential in explaining both individual and organisational behaviour (Grant, 2008b; Ryan and Deci, 2000). Motivation can come from different sources, such as external or internal drivers (Calder and Staw, 1975; Osterloh and Frey, 2000; Ryan and Deci, 2000). Extrinsic motivation drives individuals to engage in an activity to attain a positive reward or to avoid a negative external outcome. The underlying reason for behaviour in this case is that the behaviour is necessary to obtain outcomes that are separate from the behaviour itself. In contrast, intrinsic motivation drives individuals to engage in an activity for its own sake. The reason underlying the behaviour is inherent in the behaviour itself, because it is in line with their intrinsic interest and personal values (Ryan and Deci, 2000). This section overviews the current knowledge of the two main categories of factors motivating individual knowledge sharing: extrinsic and intrinsic motivators.

### Intrinsic motivation and knowledge sharing

Intrinsically motivated individuals have more interest, excitement and confidence which lead to highly valued behavioural outcomes such as creativity, innovation and learning (Amabile, 1997; Ryan and Deci, 2000; Vallerand and Bissonnette, 1992; Vansteenkiste et al. 2004). Intrinsic motivation is particularly important to voluntary and pro-social behaviours (Gagné, 2009; Grant, 2008b). Gagné (2009) argues that knowledge sharing behaviour is often compared with other voluntary and pro-social behaviours and it is therefore likely to be motivated in a similar way. Several studies have demonstrated the importance of intrinsic motivational factors for knowledge sharing (Foss et al. 2009; Kankanhalli et al. 2005; Ko et al. 2005; Lin, 2007; Reinholt et al. 2011; Yang and Farn, 2009). The key intrinsic motivators that surface are self-efficacy, meaningfulness and impact.

Self-efficacy is "the *judgment* an individual makes about his or her *ability* to execute a particular behaviour" (Bandura, 1978, p. 240, italics added, in Staples et al. 1999, p.759). When people have a strong sense of self-efficacy, they are more confident about their capability to execute a particular behaviour. This leads to greater effort in mastering challenges while people with a weak sense of self-efficacy are likely to reduce their efforts or even quit (Staples et al. 1999). Cabrera and Cabrera (2005) and Gagné (2009) argue that self-efficacy will encourage positive attitudes toward knowledge sharing. If individuals have positive feelings about their ability to provide valuable knowledge, they will be more likely to have positive feelings toward knowledge sharing e.g. because they believe their knowledge can be helpful to others (Cabrera and Cabrera, 2005). Lin (2007) examined the role of knowledge self-efficacy in explaining employee knowledge sharing attitudes and found that self-efficacy had a strong positive relationship with employee attitudes toward knowledge sharing. Kankanhalli et al. (2005) found that knowledge self-efficacy had a positive influence on contribution to knowledge repositories. Yang and Farn (2009) found that knowledge self-efficacy had a significant positive effect on the intention to provide tacit knowledge.

Meaningfulness is the perceived value of a particular behaviour, judged in relation to the individual's own ideals or standards (Gagné et al. 1997; Hackman and Oldham, 1980; Thomas and Velthouse, 1990). If the outcome of behaviour is assessed as having a worthy purpose, a purpose that is valuable and makes a difference, then the behaviour will be seen as meaningful (Thomas, 2009). A behaviour that is experienced as meaningful should increase motivation for that behaviour. Meaningfulness can also be seen as caring about a task and having a passion for it (Hackman and Oldham, 1976; Thomas, 2009). High degrees of meaningfulness are believed to result in commitment, involvement and concentration of energy (Thomas and Velthouse, 1990).

Impact is defined as the degree to which behaviour is seen as "making a difference" in terms of producing intended effects and having control over desired outcomes through one's behaviour (Gagné et al. 1997; Thomas and Velthouse, 1990). Impact refers to the sense that what you are doing is actually accomplishing something. When employees recognize the connection between their behaviour and outcomes for others or the organisation they gain a sense of impact. Accordingly, theorists have mentioned the importance of knowledge of the results of the behaviour (Hackman and Oldham, 1976; Thomas and Velthouse, 1990). When an individual knows how

effective his/her behaviour is and has knowledge of the progress of realization of the purpose of the behaviour it can contribute to the individual's perception that he or she is making a difference.

### **Extrinsic motivation and knowledge sharing**

In contrast to intrinsic motivation, extrinsic motivation for behaviour is not rooted in the content of the activity itself but in obtaining an external outcome from engaging in the activity. Extrinsic motivation is considered to be important to motivate employees to perform in a coordinated and goal oriented way, whereas intrinsic motivation may have a more uncertain outcome and is more difficult to change (Osterloh and Frey, 2000). Managers may be able to make unwanted behaviour costly and less attractive and desired behaviour more attractive for employees by offering them appropriate benefits.

Prior research suggests that extrinsic motivation can also be important for knowledge sharing (Bock et al. 2006; Chen and Hung, 2010; Kankanhalli et al. 2005; Lin, 2007; Lin et al. 2009; Wasko and Faraj, 2005). From a socio-economic perspective, if the perceived benefits of knowledge sharing exceed the costs, then people will continue to share (Lin, 2007). The perceived costs of sharing include time, effort and loss of power. In order to motivate people to share regardless of the potential costs, companies must ensure there are benefits to share and an example of this can be to provide extrinsic rewards.

Key extrinsic benefits that arise from the literature are organisational rewards, reciprocity, and reputation (Bock et al. 2006; Chen and Hung, 2010; Kankanhalli et al. 2005; Lin, 2007; Lin et al. 2009; Wasko and Faraj, 2005;).

Organisational rewards can include financial rewards such as increased pay and bonuses and non-financial rewards such as job security and promotion (Bartol and Srivastava, 2002; Kankanhalli et al. 2005). Several organizations have implemented reward schemes to promote knowledge sharing behaviour. For example, at Cap Gemini Ernst & Young, the employee's knowledge sharing activities are considered in merit pay decisions (Bartol and Srivastava, 2002). Within a range of 2-5, employees can't score higher than 3 if they have not engaged in knowledge sharing.

Kankanhalli et al. (2005) found that organisational rewards had a positive influence on knowledge contribution through an electronic knowledge repository (EKR). Furthermore, on seeking knowledge through an EKR, Kankanhalli et al. (2005b) demonstrate that organisational rewards have a significant positive influence when task interdependence is high. Lin (2007) did not find rewards to have a significant effect on knowledge sharing attitude and intention. They suggest this might be because the sample was comprised mostly of executives who may be motivated by other objectives rather than organisational rewards; this indicates it may be important to control for certain factors such as position in the organisation. Bock et al (2005) also did not find a significant influence on knowledge sharing attitude and intention in their study of organisations in Korea. These mixed findings suggest that it is important to further investigate the role of organisational rewards in knowledge sharing and reasons why different impacts have been found.

Reciprocity represents the expectation of future help through knowledge sharing behaviour. It refers to a sense of mutual indebtedness (Kankanhalli et al. 2005; Lin, 2007). Lin (2007)'s results showed reciprocal benefits significantly and positively influenced attitudes toward knowledge sharing in Taiwanese organisations. Contrary to these results, Wasko and Faraj (2005) found reciprocity to be negatively related to knowledge contribution through an electronic community of practice. In their discussion they suggest that in an electronic community of practice, relational capital may not develop. Supporting this outcome are Chen and Hung (2010)'s findings in their study of knowledge sharing behaviour in professional virtual communities. Here, reciprocity was not significant for knowledge contributing and negatively related to knowledge seeking behaviour. Lin (2009) also demonstrated that reciprocity was not related to knowledge sharing in professional virtual communities. These findings indicate it is important to further investigate reasons for these differential impacts.

Finally, a good reputation can be an important asset for employees. It can give them respect and may be important for job security and advancement (Kankanhalli et al. 2005). Employees can increase their reputation in the workplace by sharing valuable knowledge with others. Research has shown that knowledge sharing can be fuelled by a desire for recognition from peers (O'Dell and Grayson, 1998).

In summary, research indicates that extrinsic motivators may also be important to understand knowledge sharing in addition to intrinsic motivators. However, some results show specific extrinsic motivators to be important while others do not show a significant influence of extrinsic motivators on knowledge sharing (Bock et al. 2006; Chen and Hung, 2010; Kankanhalli et al. 2005a, 2005b; Lin et al. 2009; Wasko and Faraj, 2005). These mixed findings suggest further investigation is needed.

### **RESEARCH MODEL**

To develop an integrative view of the motivators influencing individuals' willingness to share knowledge, the Theory of Reasoned Action (TRA) (Fishbein and Ajzen, 1975) will be used as a theoretical framework. TRA assumes that an individual's intention to engage in behaviour is the immediate determinant of the action. Behavioural intention is, in turn, determined by the individual's attitude toward performing the behaviour, and the subjective norms regarding the behaviour.

Attitude toward performing the behaviour is determined by the individual's salient beliefs that performing the behaviour will lead to certain consequences and the individual's evaluation of those consequences. The subjective norm is determined by the individual's beliefs about whether significant others think he or she should perform the behaviour and the individual's motivation to comply with those significant others (Figure 1).

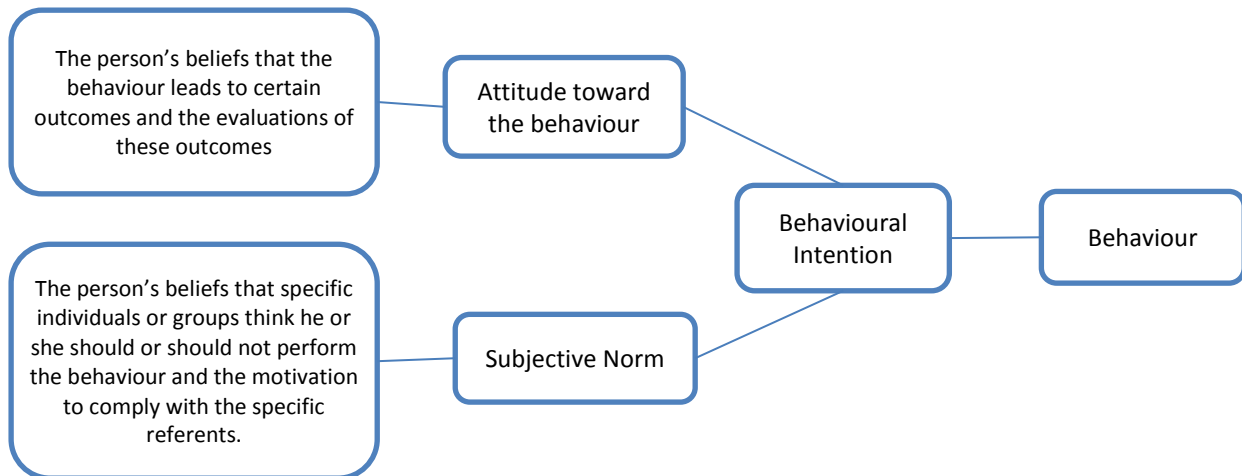


Figure 1 The Theory of Reasoned Action (Fishbein and Ajzen, 1975)

The key application of the Theory of Reasoned Action is the prediction of behavioural intention, which spans predictions of attitude and behaviour. It can be applied to explain virtually any human behaviour. Therefore, the nature of the beliefs that influence intention through attitude and subjective norm are left unspecified. This allows integration of other theoretical perspectives to inform as per the salient beliefs that would be examined in the model. Based on this explanatory power, the Theory of Reasoned Action can be a useful model for examining intrinsic and extrinsic motivators as the salient determinants of knowledge sharing attitude and intention. This study follows the TRA belief-attitude-intention relationship based on previous research on knowledge sharing motivations (Bock et al. 2005; Lin, 2007).

### Attitude toward knowledge sharing

The intention to engage in certain behaviours is determined by an individual's attitude toward that behaviour (Ajzen and Fishbein, 1980). Here, attitude toward knowledge sharing is defined as the degree to which an individual positively evaluates his or her knowledge sharing. Intention to share knowledge is defined as the degree to which an individual believes that he or she will engage in knowledge sharing behaviour (Bock et al. 2005). The relationship between attitude toward knowledge sharing and intention to share knowledge has been supported by the Theory of Reasoned Action in other studies. Bock and Kim (2002) and Bock et al. (2005) found positive relationships between favourable attitudes toward knowledge sharing and intentions to share knowledge. Lin (2007) also found that employees with the strongest knowledge sharing intentions had more positive attitudes toward knowledge sharing behaviour. This leads to the first hypothesis.

**H1: The more favourable the attitude toward sharing knowledge, the greater the intention to share knowledge.**

### Subjective Norm

The subjective norm construct is the individual's perception of social pressure to perform or not perform a particular behaviour (Ajzen, 1991). The subjective norm is formed as the individual's normative beliefs weighted by motivation to comply. The normative beliefs reflect the individual's perception of the opinion of a person or a group whose beliefs may be important to the individual about the individual's performance of the behaviour. The motivation to comply is the extent to which the person wants to comply with the wishes of a person or group whose beliefs may be important to the individual (Mathieson, 1991). There has been

considerable empirical support for the role of subjective norm as an important determinant of behavioural intention (Brock et al. 2005; Lin and Lee, 2004). Hence it is expected that:

**H2: The greater the subjective norm to share knowledge, the greater the intention to share knowledge.**

### **Beliefs toward Knowledge Sharing**

Beliefs about knowledge sharing represent the individual's motivational beliefs that influence attitude toward knowledge sharing. They are divided into two groups: extrinsic and intrinsic motivators. Extrinsic motivators reflect the beliefs that the individual will receive extrinsic benefits when sharing knowledge and intrinsic motivators reflect the belief that the individual will receive intrinsic benefits when sharing knowledge.

### **Intrinsic motivators**

From an intrinsic motivational perspective, behaviour is also evoked by an employee's self-efficacy beliefs. Cabrera and Cabrera (2005) and Gagné (2009) argue that self-efficacy will encourage positive attitudes toward knowledge sharing. If individuals have positive feelings about their ability to provide valuable knowledge, they will be more likely to have positive feelings toward knowledge sharing e.g. because they believe their knowledge can be helpful to others (Cabrera and Cabrera, 2005), and that their knowledge can help solve job-related problems and improve work efficacy (Lin, 2007). Lin (2007) examined the role of knowledge self-efficacy in explaining employee knowledge sharing attitudes through a survey of employees from 50 organisations in Taiwan. The results showed that knowledge self-efficacy had a strong positive relationship with employee attitudes toward knowledge sharing. Lin et al. (2009) found that knowledge sharing self-efficacy significantly positively influenced knowledge sending behaviour in professional virtual communities. Also, Reinholt et al. (2011) found that knowledge receiving was highest when knowledge sharing ability was also high. This leads to the following hypothesis.

**H3: The greater the sense of self-efficacy in relation to knowledge sharing behaviour, the more favourable the attitude toward sharing knowledge.**

Individuals who regard a particular behaviour as worthwhile, useful and valuable will experience meaningfulness and are likely to be motivated to engage in that behaviour (Zhang et al. 2009). Zhang et al. (2009) found that meaningfulness has a significant and positive effect on knowledge sharing behaviour through increasing psychological engagement at work. Experienced meaningfulness is therefore likely to be associated with a positive attitude toward knowledge sharing. In a case study on expert knowledge, Sié and Yakké (2009) found that experts have a favourable attitude towards knowledge sharing, as they usually invest years of practice in the expert area and can become emotionally attached to the knowledge. Thus, experienced meaningfulness is posited to encourage more positive attitudes toward knowledge sharing. This leads to the following hypothesis.

**H4: The greater the sense of meaningfulness in relation to knowledge sharing behaviour, the more favourable the attitude toward sharing knowledge.**

In the knowledge sharing literature there is relatively little research that investigates the role of impact in relation to knowledge sharing motivation when compared with other motivators. One of the few, Brock and Kim (2002) found that expected contribution, that is if an employee feels he or she can make a significant contribution to the organisation's performance through sharing knowledge, was positively related to knowledge sharing attitude. In the cognitive motivational literature the notion of perceived impact on motivation to engage in a particular behaviour is emphasized by several theorists. Grant (2007; 2008a) argues that when employees perceive that their behaviour has an impact, they are likely to engage in the pursuit of making a pro-social difference. Several researchers have focused on the importance of knowledge of the results of one's work efforts to gain a sense of impact, which in turn increases motivation for "superior effort and performance" (Hackman and Oldham, 1976, p. 251) (Foss et al. 2009). The above findings and reasoning lead to the expectation that a sense of impact regarding knowledge sharing will positively influence an individual's attitude toward knowledge sharing. Hence:

**H5: The greater the sense of impact in relation to knowledge sharing behaviour, the more favourable the attitude toward sharing tacit knowledge.**

### **Extrinsic motivators**

When individuals believe that knowledge sharing will give them the benefit of future help from others, this may motivate them to share. The research outcomes regarding the effect of expected reciprocity on knowledge sharing are mixed. Brock et al. (2005) and Lin (2007) found reciprocal benefits positively influence attitudes toward knowledge sharing. Other research which had investigated knowledge sharing through electronic channels did not find a significant relationship between reciprocity and knowledge sharing (Chen and Hung,

2010; Kankanhalli et al. 2005; Lin, 2007; Wasko and Faraj, 2005). This difference in findings may be influenced by the context of the study in terms of the knowledge sharing environment. It is therefore expected that:

**H6: The greater the expected reciprocity benefits in relation to knowledge sharing behaviour, the more favourable the attitude toward sharing knowledge.**

The belief that knowledge sharing will lead to enhanced reputation in the workplace may also motivate individuals to share knowledge. Although Kankanhalli et al. (2005) did not find image (a related concept) important for contributing knowledge through an EKR, other research suggests a positive relationship between reputation and knowledge contribution (Wasko and Faraj, 2005). The following hypotheses are proposed:

**H7: The greater the expected enhanced reputation in relation to knowledge sharing behaviour, the more favourable the attitude toward tacit knowledge sharing.**

Prior research findings on the influence of organisational rewards on knowledge sharing are mixed. Lin (2007) and Bock et al (2005) did not find significant impact on knowledge sharing attitude, however they did not distinguish explicit and tacit knowledge. On the other hand, Kankanhalli et al. (2005a, 2005b) in investigating explicit knowledge sharing found that organisational rewards had a positive influence on knowledge contribution and knowledge seeking through an EKR. This suggests that organisational rewards may have a positive influence on knowledge sharing in certain contexts. The following hypothesis is proposed:

**H8: The greater the expected organisational rewards in relation to knowledge sharing behaviour, the more favourable the attitude toward sharing knowledge.**

In addition to tangible organisational rewards, the motivational literature recognizes the importance of verbal rewards. Deci et al (2001) argue that individuals will engage in behaviours to seek praise and that they associate verbal rewards with feedback. In such situations, verbal rewards can have a controlling effect. This controlling effect is observed more often for example, when a teacher provides the feedback and students feel pressure to perform. In the context of knowledge sharing therefore, it is likely that feedback from superiors will influence attitude and intention. Verbal rewards can also be used as informational mechanisms to improve perceived competence. The discussion on verbal rewards and knowledge sharing is scarce and there no empirical evidence was found supporting a relationship between verbal rewards and knowledge sharing behaviour. However in their review paper on motivation and knowledge sharing Lam and Ford (2010) acknowledge that tangible rewards may have limited or even negative impact on knowledge sharing and that rewards that provide feedback and recognition will be more effective. The following hypothesis is therefore proposed:

**H9: The greater the expected feedback from superiors in relation to knowledge sharing behaviour, the more favourable the attitude toward sharing knowledge.**

## METHODOLOGY

To assess the research model, data was collected from employees in knowledge-intensive positions across 11 medium- to large-sized organisations. For each organisation a contact person was identified; this individual facilitated the study by distributing hard copies of the survey or links to the online version of the survey. Altogether 133 usable responses were returned. Of the participants, 78 (58.6%) were male and 55 (41.4%) were female. Respondents came from a range of organisation types including 30.8% from Manufacturing and Production, 21.1% from Information Technology and Communications, and 14.3% from Financial Services. 54.4% of the persons were from firms with 50-99 staff, while 40.6% from firms with over 100 employees.

### Measures

Multi-item scales were used to assess the constructs in the research model (See sample items listed in Appendix 1). All the items were adapted from existing sources to fit the research setting of knowledge sharing. The attitude scale consisted of four items and subjective norms of three items adapted from Ajzen and Fishbein (1980). Three items measuring intention to share knowledge were adapted from Ajzen and Fishbein (1980) and Bock, et al (2005). Intrinsic motivation was assessed using three indicators (with three items each) - self-efficacy, meaningfulness and impact (Spreitzer 1995). Extrinsic motivators that is, reciprocity, reputation, organisational rewards and supervisor feedback were assessed using 3-5 items each drawn from prior research (Bock et al 2005; Deci et al 2001; Kankanhalli et al 2005a; Lin, 2007; Wasko and Faraj 2005). Altogether the research model comprised 37 items representing the ten constructs (including seven motivators) shown in Figure 1. All items were measured using 7-point Likert-type scales ranging from 1 (Strongly Disagree) to 7 (Strongly Agree).

Prior to survey administration, the instrument was pretested and evaluated using responses from 10 individuals. Minor changes were made based on their collective suggestions.



## DATA ANALYSIS AND RESULTS

PLS-Graph 3.0 (Build 1130) and SPSS Version 20.0 were used to assess the research model, and bootstrapping (with 500 resamples) used to assess the significance of the model paths.

First, the measurement model was evaluated. Recommended guidelines suggest that ideally the item loadings should exceed 0.707; loadings of 0.60 are also acceptable (Chin 2010). The results (Table 1) showed that all items were well-above the recommended threshold ranging from 0.818 to 0.977 except for one item measuring organisational rewards which returned a factor loading just below 0.707 (at 0.637). Table 2 shows the composite reliabilities ranged from 0.876 to 0.975 and average variance extracted (AVE) ranged from 0.707 to 0.906, exceeding recommended cut-offs (Chin 2010).

To determine if a construct is more closely related to its own indicators than other constructs (i.e. discriminant validity), researchers often compare the square root of the average variance extracted with the construct correlations. Similarly one can compare the AVEs with the squared correlations. This has the advantage of representing the shared variance (or percentage overlap) among the constructs and constructs to indicators in a more intuitive manner, making it easier to interpret the differences between the constructs (Chin 2010). As shown in Table 2, the construct AVEs are greater than the squared correlations among the constructs. While most constructs returned a low level of shared variance, attitude showed a 55% overlap with intention. However the shared variance between attitude and its indicators is 75% suggesting a much stronger relationship with its own indicators than other constructs. Since this study suggests a close relationship at the construct level between attitude and intention (Bock et al., 2005), this result and difference is reasonable (Chin, 2010).

OR we can replace all of the above with the following (and leave the fuller explanation for the conference:

To assess discriminant validity the average variance extracted is compared with the squared correlations among the constructs. The results shown in Table 2 indicate that the percentage overlap (i.e. shared variance) between a construct and its indicators is greater than that shared with other constructs. This indicates that each construct is much more closely related to its own indicators than to other constructs, hence satisfying the criteria for discriminant validity (Chin 2010).

Table 1: Item Loadings

Construct	Item Loadings	Construct	Item Loadings	Construct	Item Loadings
Attitude		Impact		Reputation	
Attitu01	0.852	Impact01	0.888	Reput01	0.845
Attitu02	0.853	Impact02	0.924	Reput02	0.925
Attitu03	0.913	Impact03	0.961	Reput03	0.916
Attitu04	0.848	Impact04	0.958	Reput04	0.903
Subjective Norms		Self-Efficacy		Supervisor Feedback	
SbNorm01	0.918	SE01	0.909	FdBck01	0.959
SbNorm02	0.956	SE02	0.922	FdBck02	0.951
SbNorm03	0.952	SE03	0.935	FdBck03	0.952
Intention		Meaningfulness		FdBck04	0.926
		Mean01	0.946	FdBck05	0.915
		Mean02	0.948	Reciprocity	
		Mean03	0.961		
		Organisational Rewards			
		Reward01	0.637		
		Reward02	0.887		
		Reward03	0.965		
				Recipr01	0.905
				Recipr02	0.891
				Recipr03	0.911
				Recipr04	0.825
				Recipr05	0.818

Table 2: Composite Reliabilities (CR), Average Variance Extracted (AVE), and Inter-Construct (Squared) Correlations

[illegible]

Subjective Norms (SN)	0.959	0.247	<b>0.887</b>								
Intrinsic Motivators											
Self-Efficacy (SE)	0.945	0.333	0.193	<b>0.850</b>							
Meaningfulness (MN)	0.967	0.338	0.137	0.249	<b>0.906</b>						
Impact (IM)	0.964	0.200	0.168	0.213	0.177	<b>0.871</b>					
Extrinsic Motivators											
Reciprocity (RC)	0.940	0.375	0.276	0.165	0.307	0.289	<b>0.758</b>				
Reputation (RP)	0.943	0.318	0.267	0.110	0.159	0.257	0.391	<b>0.806</b>			
Organisational Rewards (RW)	0.876	0.092	0.111	0.035	0.064	0.158	0.087	0.285	<b>0.707</b>		
Supervisor Feedback (SF)	0.975	0.094	0.147	0.096	0.124	0.216	0.203	0.249	0.133	<b>0.885</b>	
Intention (INT)	0.932	0.554	0.224	0.261	0.269	0.138	0.346	0.229	0.067	0.063	<b>0.820</b>

Note: Bolded items represent Average Variance Extracted (AVE); the off-diagonal elements are the squared correlations among constructs.

Next, the structural model was examined. The results (Figure 2) show that the substantive model for accounted for 0.568 of the variance observed for intention to share knowledge. Both antecedent variables, attitude ( $\beta=0.676$ ;  $p \leq 0.001$ ) and subjective norms ( $\beta=0.137$ ;  $p \leq 0.10$ ), were significant with respect to intention to share knowledge. Hypotheses H1 and H2 were therefore supported.

The model further accounted for 0.578 of the variance observed for attitude. For the intrinsic motivators, the results showed self-efficacy ( $\beta=0.315$ ;  $p \leq 0.001$ ) and meaningfulness ( $\beta=0.222$ ;  $p \leq 0.05$ ) were significant vis-à-vis attitude; Hypotheses H3 and H4 were therefore supported. However contrary to expectations, impact ( $\beta=-0.0016$ ) was not significant re attitude; Hypothesis H5 was therefore not supported. Turning to extrinsic motivators, the results showed a significant link between attitude and, reciprocity ( $\beta=0.245$ ;  $p \leq 0.05$ ) and reputation ( $\beta=0.274$ ;  $p \leq 0.10$ ) supporting Hypotheses H6 and H7. However, the link between organisational rewards ( $\beta=0.019$ ) and attitude was not significant; Hypothesis H8 was therefore not supported. Contrary to expectations, Hypothesis H9 was also not supported, with the results returning a significant inverse relationship between attitude and supervisor feedback ( $\beta=-0.117$ ;  $p \leq 0.10$ ).

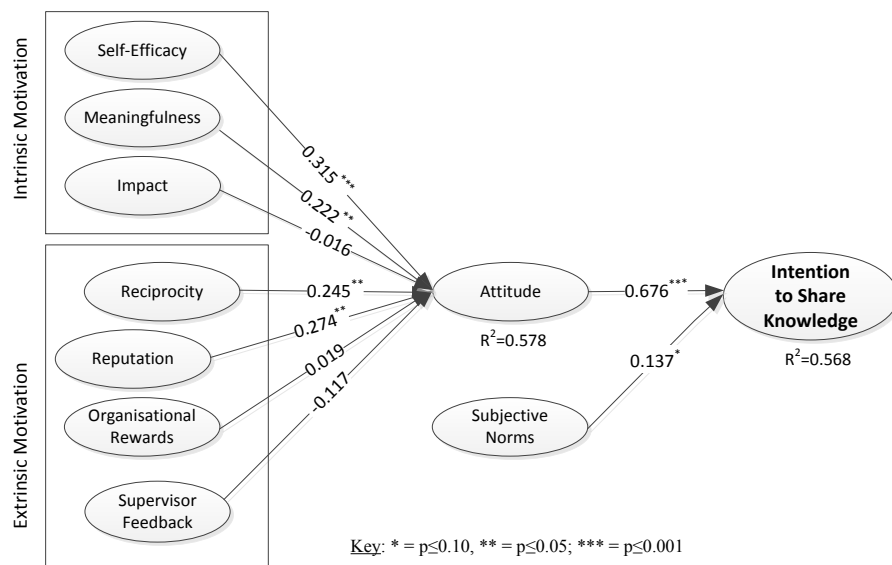


Figure 2: Results of the Model Test

## CONCLUSION

This study identifies important intrinsic and extrinsic motivators and provides empirical evidence regarding the influence of these motivators on knowledge sharing attitudes and intentions. It provides a richer picture of motivation in the context of knowledge sharing as it proposes and tests an integrative model and demonstrates the relative importance of the motivators. It therefore contributes to a better understanding of the employee's willingness to share knowledge and can be used to inform the motivational mechanisms to encourage sharing.

Based on an extensive literature review and integrating multiple theories a comprehensive model is proposed that includes a number of key intrinsic and extrinsic motivators. The data provided to test and validate the model largely supports the original hypotheses and provides further unexpected insights. It emphasizes the importance

of intrinsic motivation which has largely been neglected. In the area of extrinsic motivation, it demonstrates that motivations based on social capital and recognition are more important than tangible rewards. This is contrary to common practice in organisations to align knowledge sharing encouragement to performance reviews and financial rewards. Feedback from supervisors which has not been tested before was confirmed as important. Supervisor feedback and comments therefore provided one of the most surprising findings. It was expected that informational feedback will have a positive effect on KS attitude and intention. However, it has a significant inverse effect. Future research is needed to understand better this motivator.

Finally, and notwithstanding the insights provided by this study, there are some limitations to consider when applying the findings to other settings. For example, although data collection covered a range of organisation types the focus was on firms in New Zealand, which may limit the applicability of some findings to other contexts. In particular, the national culture may reflect the importance of positive and neutral feedback from supervisors. Second, although a more comprehensive assessment of intrinsic and extrinsic motivators is undertaken in this study accounting for seven motivators altogether, there may be other motivators that were not considered. For example, although the intrinsic motivators examined in this study are widely acknowledged as key in the motivational literature (Hackman and Oldham 1980; Ryan and Deci 2000; Thomas and Velthouse 1990) there may be other intrinsic motivators impacting knowledge sharing that have not been included. Further, research suggests that some extrinsic motivators, such as extrinsic rewards may undermine intrinsic motivation (Brock et al 2005; Osterloh and Frey 2000). However, the impact of extrinsic rewards in relation to intrinsic motivation was not examined in this study. Future research is needed to assess such impacts and the implications for developing a knowledge sharing culture in organisations.

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## APPENDIX A: SURVEY SAMPLE ITEMS

Attitude towards Knowledge Sharing (ATT)	My knowledge sharing with other organisational members is good.
Subjective Norm (SN)	People in my organisation who are important to me think I should share my knowledge with other members in the organisation
Self-Efficacy (SE)	I am confident about my ability to share knowledge with other organisational members.
Meaningfulness (ME)	My knowledge sharing with other organisational members is personally meaningful to me.
Impact (IM)	My knowledge sharing with other organisational members has a large impact on what happens in my organisation.
Supervisors Feedback (SF)	My superiors give me feedback when I share my knowledge with other organisational members
Reciprocity (RP)	My knowledge sharing would strengthen the ties between existing members in the organisation and myself
Reputation (RP)	I earn respect from other organisational members by sharing my knowledge in the organisation
Organisational Rewards (RW)	I will receive monetary rewards in return for my knowledge sharing with other organisational members
Intention to Share Knowledge (INT)	I will always make an effort to share my knowledge with other organisational members.